NINEMILE RESERVOIR

Introduction

Ninemile Reservoir is an intermediate sized reservoir at the south end of the Sanpete Valley in Central Utah. It is located alongside US-89 between Manti and Gunnison, at the western base of the Wasatch Plateau. It is also known as Highland Reservoir.

Ninemile Reservoir was created in 1900 by the construction of an earth-fill dam. In 1982 the dam was raised, increasing the capacity from from 3,015 acre feet to 3,500 acre feet. The reservoir is privately owned, but access is unrestricted. Water use is for primarily for irrigation and recreation with no changes foreseen in the future.

Characteristics and Morphometry

Lake elevation (meters / feet)	1,649 / 5,402
Surface area (hectares / acres)	86 / 213
Watershed area (hectares / acres)	732 / 1810
Volume (m^3 / acre-feet)	
capacity	4,320,000 / 3,500
conservation pool	0
Annual inflow (m^3 / acre-feet)	4,317,250 / 3,500
Retention time (years)	1
Drawdown (m^3 / acre-feet)	18,502 / 15
Depth (meters / feet)	
maximum	11 / 36
mean	4.6 / 15
Length (meters / feet)	1,750 / 5,742
Width (meters / feet)	816 / 2,677
Shoreline (meters / feet)	4,320 / 14,174

Location

County	Sanpete
Longitude / Latitude	111 42 30 / 39 10 30
USGS Maps	Sterling, UT 1966
DeLorme's Utah Atlas & Gazetteer™	Page 37 B-6
Cataloging Unit	San Pitch (16030004)

Recreation

Ninemile Reservoir is accessible from the US-89 south of Sterling at the junction with U-137 (see map). It is six miles east of Gunnison and six miles south of Manti. Access to the dam is via an unimproved road west of the US-89 immediately west of the U-137 junction.

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The primary recreational use of the reservoir is fishing. Usage is light, and there are no facilities of any sort.

Palisade State Park is one mile east of Sterling. It has 53 campsites, a sandy beach, modern rest rooms with hot showers, a group camping area, a nine-hole golf course and a pavilion. Usage fees are charged. There is also a USFS campground seven miles up Manti Canyon.

There are private campgrounds in Gunnison and Manti (see info box).

Watershed Description

Ninemile Reservoir is used to store springwater throughout the winter for irrigational use during the growing season. The only inflowing perennial stream originates from a spring about one mile northeast of the reservoir. Additional water is diverted to the reservoir via the Sterling Irrigation Diversion from Six Mile Creek. The small watershed also provides some runoff during snowmelt.

The watershed high point, 1.5 miles east of the reservoir, is 2,036 m (6,680 ft) above sea level, thereby developing a complex slope of 19.8% to the reservoir. The outlet is the Highland Canal, with any overflow water draining into the San Pitch River. The average stream gradient between the principle spring and the reservoir is 5.6% (295 feet per mile).

The watershed is comprised of alluvial plains, alluvial fans, and low mountains. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of pinyon-juniper, sagebrush-grass, and bitterbrush. The watershed receives 30 cm (12 inches) of precipitation annually. The frost-free season around the reservoir is 100 -140 days per year.

According to the 1982 Clean Lakes Inventory, land use is as follows. Native grazing (mostly cattle and sheep) and wildlife land (the Ninemile State Wildlife Area is managed as winter range for wildlife) comprise 42% each, while 10% is pasture and hayland and 6% is urban.

Limnological Assessment

The water quality of Ninemile Reservoir is good. It is considered to be very hard with a hardness concentration value of approximately 302 mg/L (CaCO3). The only parameter that has exceeded State water quality standards for defined beneficial uses is total phosphorus. The average concentrations of total phosphorus in the water column typically does not violate the criteria but on September 9, 1992 with only 2.3 meters of water in the reservoir, the average concentration was 260 ug/L. This increase of nutrients late in the year leads to an increased productivity at the reservoir. Large mats of algae are present on the reservoir during this period of the year.

Current data indicates that the reservoir is a nitrogen limited system. TSI values indicate the reservoir is mesotrophic to eutrophic with seasonal variability. The high alkalinity associated with the reservoir may be limiting productivity too. The reservoir does not stratify due to its shallow nature and fairly rapid drawdown as indicated by the September 9, 1992 profile. Macrophytes are present and are fairly extensive during late summer.

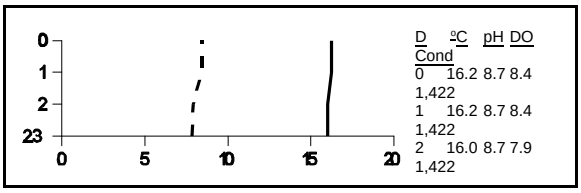
Limnological Data

Data averaged from STORET sites: 594324, 594325

Surface Data	1981	1990	1992
Trophic Status	E	M	E
Chlorophyll TSI	-	45.79	49.69
Secchi Depth TSI	-	47.84	54.65
Phosphorous TSI	61.94	41.93	73.9
Average TSI	61.94	45.19	59.42
Chlorophyll a (ug/L)	-	4.7	7.1
Transparency (m)	-	2.3	2.1
Total Phosphorous (ug/L)	55	14	127
pH	-	8.8	8.9
Total Susp. Solids (mg/L)	17	6	5
Total Volatile Solids (mg/L)	-	-	4
Total Residual Solids (mg/L)	-	-	2
Temperature (°C / °f)	-	22/71	17/63
Conductivity (umhos.cm)	-	829	901
Water Column Data			
Ammonia (mg/L)	0.1	0.14	0.03
Nitrate/Nitrite (mg/L)	0.53	0.23	0.17
Hardness (mg/L)	290	272	326
Alkalinity (mg/L)	308	276	325
Silica (mg/L)	-	-	3.9
Total Phosphorous (ug/L)	40	15	133
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	-	12.6	8.0
Stratification (m)	-	NO	NO
Depth at Deepest Site (m)	-	1.7	2.3

According to DWR no fish kills have been reported in recent years. The DWR stocks the reservoir annually with either 15,000 catchable Rainbow Trout or 3,000 catchable and 25,000 advanced fingerling Rainbow Trout. Historical DWR records show the reservoir once had cutthroat, brown and brook trout. Also present were, fathead minnow (*Pimephales promelas*), and green sunfish (*Lepomis cyanellus*). It was drained in 1981 to raise the dam. In addition the reservoir was chemically treated

in 1959 and 1970 by the DWR to control rough fish competition.



Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm^3/liter)	% Density By Volume
Peridinium sp.	8.312	43.861
Tetraedron minimum	5.747	30.32
Pennate diatoms	3.2912	17.37
Pandorina morum	0.667	3.52
Scenedesmus quadricauda var. quadrispina	0.578	3.05
Centric diatoms	0.142	0.75
Unknown spherical green alga	0.072	0.38
Scenedesmus sp.	0.033	0.18
Oocystis sp.	0.031	0.16
Euglena sp.	0.025	0.13
Ankistrodesmus falcatus	0.022	0.12
Chlamydomonas sp.	0.019	0.10
Merismopedia sp.	0.011	0.06
Total	18.948	
Shannon-Weaver [H']	1.36	
Species Evenness	0.53	
Species Richness	0.51	

The phytoplankton community is dominated by flagellates and green algae indicative of moderate productivity and good water quality.

Pollution Assessment

Nonpoint pollution sources include the following: sedimentation and nutrient loading from grazing, and cropland; and wastes and litter from recreation

One major use of the watershed is livestock grazing, resulting in increased runoff and soil erosion. The area around the reservoir is rangeland and cropland with animals grazing in direct proximity to the water. These land uses can impact the reservoir through increased sediment production, higher nutrient loadings and contamination from agricultural chemicals when utilized.

Beneficial Use Classification

The state beneficial use classifications include: boating and similar recreation (excluding swimming) (2A), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

Information

Management Agencies	
Six County Commissioners Association	896-9222
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Recreation	
Panoramaland Travel Region (Richfield)	896-9222
Manti Chamber of Commerce	835-6271
Palisade State Park	835-7275
Lund's Campground (Gunnison)	528-3366
Manti Campground	835-7851
Reservoir Administrators	
Gunnison Irrigation Company	528-7961

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